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The Administrative Record Staff

Department of Energy

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ROCKY FLATS PLANT
CORRESPONDENCE CONTROL

91-DOE-9391

Mr. Martin Hestmark
U. S. Environmental Protection Agency, Region VIII
ATTN: Rocky Flats Project Manager, 8HWM-RI
999 18th Street, Suite 500, 8 WM-C
Denver, Colorado 80202-2405

Mr. Gary Baughman
Hazardous Waste Facilities Unit Leader
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220

Gentlemen:

This letter transmits our proposed Operable Unit 2 Subsurface Investigation Interim Measure/Interim Remedial Action Plan/Environmental Assessment (IM/IRAP/EA) document outline, candidate source removal investigation approaches, and proposed schedule as per your October 11, 1991 letter and our October 30, 1991 meeting. For the most part we are proposing the time frames agreed to in the OU2 Woman Creek Basin IM/IRAP/EA schedule. The major difference in schedule between this IM/IRA and the Woman Creek Basin IM/IRA is the addition of DOE Headquarter (HQ) timeframes for review and approval of draft and final documents prior to submittal to you. This includes the Draft and Final IM/IRAP/EA as well as the Responsiveness Summary (RS). The additional time the DOE HQ requires (from what was in the Woman Creek Basin IM/IRAP/EA) amounts to 30 working days (6 weeks), for a total of 60 working days (12 weeks). We have attached a copy of the October 25, 1991 DOE HQ memorandum that contains the directive for us to request this additional time. You will note that in the DOE HQ memorandum, timeframes for the approval of NEPA documents has not been identified. Once DOE HQ identifies timeframes for HQ review and approval for EAs, we may be required to request additional time in the schedule for approval of the NEPA portions of the document.

The proposed schedule covers the period through document approval only. Resolution of the dispute concerning the timeframes for implementation of IM/IRAs is still under development. Furthermore, until we determined the specific measures to be included in this IM/IRA, we cannot propose a meaningful schedule for implementation.

ADMIN RECORD

A-OU02-000993

1A

As discussed in the October 30 meeting the approach for this Subsurface Investigation IM/IRA will focus on collecting subsurface (groundwater/vadose zone) information that will help with the final remedial action for OU2 using the Streamlined (or Observational) Approach (OSWER Directive No. 9355.3-06, "RI/FS Streamlining") and OSWER Directive No. 9355.03, "Consideration in Ground Water Remediation at Superfund Sites". Although the primary purpose is to provide early information on a final remedy, there will be an associated benefit of extraction of "source" contamination. We are submitting a copy of the draft document outline and the matrix of potential candidate source removal technologies, as we discussed in the October 30 meeting.

Should you have any questions, please feel free to contact Scott Grace of my staff at 966-7199.

Sincerely,

David P. Simonson

David P. Simonson
Assistant Manager
for Environmental Management

Enclosures

cc w/ Enclosures:
A. Rampertaap, EM-453
T. Powell, DOE/RFO
B. Thatcher, DOE/RFO
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S. Nesta, EG&G/RF

October 1991: PROPOSED OU2 SUBSURFACE IM/IRAP SCHEDULE

Duration	Start	Finish	Activity No.	Activity
74 (81)	11OCT91	31JAN92	A1	DOE Prepare Draft IM/IRAP/EA (1st working draft mid-December)
0		31JAN92	A2a	Submit Draft IM/IRAP/EA to DOE HQ for Approval
20	03FEB92	29FEB92	A2b	DOE HQ Review and Approve Draft IM/IRAP/EA
0		02MAR92	A3**	**SUBMIT DRAFT IM/IRAP/EA TO EPA/CDH**
5	03MAR92	09MAR92	A4a	EPA/CDH Review IM/IRAP/EA
10	03MAR92	16MAR92	A4b	CDH Review & Comment on Draft EA Portion of IM/IRA/EA
3	17MAR92	19MAR92	A5	Modify, Print & Distribute Document
40	20MAR92	14MAY92	A6	Public Comment Period on IM/IRAP/EA (includes Federal Register Notice and two week Public Comment on the Wetlands Action)
20	15MAY92	11JUN92	A7	DOE Prepares Responsiveness Summary (RS)
0		11JUN92	A8a	Submit Draft Responsiveness Summary to DOE HQ for Approval
20	12JUN92	09JUL92	A8b	DOE HQ Review and Approve Draft Responsiveness Summary
0		10JUL92	A9**	**SUBMIT DRAFT RESPONSIVENESS SUMMARY TO EPA/CDH**
5	13JUL92	17JUL92	A10	EPA/CDH Review Responsiveness Summary
20	20JUL92	14AUG92	A11	Resolve Comments & Finalize R.S. & IM/IRAP/EA
10	17AUG92	28AUG92	A12	Modify & Print Final RS & IM/IRAP/EA
0		28AUG92	A13a	Submit Final RS, IM/IRAP/EA & Proposed NEPA Decision to DOE HQ for Approval
20	31AUG92	25SEP92	A13b*	DOE HQ Review & Approve Final RS, IM/IRAP/EA & NEPA Decision (i.e. FONSI)
0		28SEP92	A14**	**SUBMIT FINAL R.S. & IM/IRAP/EA DECISION DOCUMENT TO EPA/CDH**
10	29SEP92	12OCT92	A15	EPA/CDH Approve R.S. & IM/IRAP/EA
5	13OCT92	19OCT92	A16	Modify, Print, & Distribute R.S. & IM/IRAP/EA
10	20OCT92	02NOV92	A17	Release R.S. & IM/IRAP/EA to Public & 2 Week availability

** and BOLDER TEXT Denotes Proposed Agreement Milestones to be added to Statement of Work Table 6.

* Future DOE HQ criteria may stipulate additional time for this activity and result in a future request for additional time for this activity.

OPERABLE UNIT NO. 2 SUBSURFACE INVESTIGATION IM/IRA
CANDIDATE SOURCE REMOVAL TECHNOLOGIES

TECHNOLOGY	PROPOSED OU2 TEST AREA	ADVANTAGES	DISADVANTAGES	DATA NEEDS
Vacuum Extraction	903 Pad	· Information for final remediation - Sweep efficiencies - Production/injection well spacing - Contaminant recovery rates - Operating Costs · Minimal risk of spreading contamination · Cost effective	· Limited to unsaturated soils · Heterogeneous subsurface (i.e., short-circuiting) · System installation may require intrusive activities.	· Test area permeability and porosity
Thermally-Enhanced Vapor Extraction (Steam injection, radio frequency heating, hot air injection)	903 Pad	· Same as above · Steam stripping · Porosity increase due to vaporization of native moisture	· Same as above · Heat may render DNAPL more mobile	· Same as above
Chemical Oxidation	Mound	· In situ contaminant destruction · Information for final remediation - Sweep efficiencies - Production /injection well spacing - Contaminant oxidation rates - Operating costs	· Heterogeneous subsurface (i.e., short-circuiting) · Non-specific attack (i.e., humic materials) · May be difficult to monitor and control reactions · In situ application does not allow introduction of UV radiation for photocatalytic enhancement	· Test area permeability and porosity · TOC content · Optimal oxidant and catalyst (hydrogen peroxide and Fe^{2+}) · Behavior of oxidant in subsurface
Soil Flushing (i.e., surfactant flooding)	East Trenches	· Information for final remediation - Sweep efficiencies - Production/injection well spacing - Contaminant removal rates - Operating costs · Lower surface tension of flush water may allow better penetration of porous media · Biodegradable surfactants available · More cost effective than solvent extraction	· Heterogeneous subsurface (i.e., short-circuiting) · Risk of spreading contamination · Contaminants not destroyed in situ	· Test area permeability and porosity · TOC content · Optimal surfactant (biodegradable, contaminant specific)

OPERABLE UNIT NO. 2 SUBSURFACE INVESTIGATION IM/IRA
CANDIDATE SOURCE REMOVAL TECHNOLOGIES
(Continued)

TECHNOLOGY	PROPOSED OU2 TEST AREA	ADVANTAGES	DISADVANTAGES	DATA NEEDS
Dechlorination	Mound	· In site contaminant destruction. · Information for final remediation. - Sweep efficiencies. - Production/injection well spacing. - Contaminant destruction rates. - Operating Costs.	· Heterogeneous subsurface (i.e., short-circuiting) · May be difficult to monitor and control reactions. · Residual agent in subsurface.	· Test area permeability and porosity. · Optimal dechlorination agent (sodium borohydrate).

OPERABLE UNIT NO. 2 SUBSURFACE INVESTIGATION IM/IRA
CANDIDATE SOURCE REMOVAL SUPPORT TECHNOLOGIES

TECHNOLOGY	PROPOSED OU2 TEST AREA	ADVANTAGES	DISADVANTAGES	DATA NEEDS
Interceptor Trench	Release containment for excavation	· Source containment · Provides for capture of unexpected contaminant release during upgradient excavation	· Requires intrusive activities to install · Not easily abandoned	· Test area permeability and porosity · Depth to bedrock
Ground-Water Extraction Wells	Dewatering for in situ source removal technologies	· Source containment · Provides for capture of unexpected containment release during upgradient excavation · Information to support final remediation - Yield - Capture - Well spacing, · Easily installed and abandoned	· Addresses dissolved - Phase contamination only · Risk of spreading contamination (especially if near source)	· Ground-water level data · Permeability and porosity

OUTLINE

OU2 SUBSURFACE INVESTIGATION INTERIM MEASURES/INTERIM REMEDIAL ACTION PLAN

DRAFT

1. INTRODUCTION

1.1 Project Background

A brief introductory discussion of the nature of OU2 soil and ground-water contamination and the associated risks to public health and the environment will be presented. The recent history of OU2 IM/IRA efforts will also be presented. This will include a discussion of the South Walnut Creek Basin surface water collection and treatment system and preparation of a draft Woman Creek Basin Surface Water IM/IRAP recommending no action based on human health risk and environmental degradation assessments. The proposed technologies for the OU2 Subsurface Investigation IM/IRA will be summarized.

1.2 Observational/Streamlined Approach

Guidance for preparation of the OU2 IM/IRAP will be cited. This discussion will focus on the Observational/Streamlined Approach set forth by the EPA's OSWER. The benefits of application of the Observational/Streamlined Approach will be noted in light of site characterization uncertainties.

2. SITE DESCRIPTION

2.1 Site Description and Background

2.1.1 Location and Facility Type

2.1.2 Operable Unit 2 Description

2.1.2.1 903 Pad Area

2.1.2.2 Mound Area

2.1.2.3 East Trenches Area

2.1.3 Surrounding Land Use and Population Density

2.2 Affected and Sensitive Environment

2.2.1 Physical Environment

2.2.2 Regional and Local Hydrogeology

2.2.2.1 Alluvial Materials

2.2.2.2 Bedrock Materials

2.2.3 Site Hydrology

2.2.3.1 Surface Water

2.2.3.2 Ground Water

2.2.4 Ecology

2.2.5 Sensitive Environments and Endangered Species

2.2.6 Wetlands

2.2.7 Historic Sites

2.3 Contaminants – Description and Sources

This section will be updated with more recent data.

2.3.1 Background Characterization

2.3.2 Ground-Water Contamination

2.3.2.1 Volatile Organic Contamination

2.3.2.2 Inorganic Contamination

2.3.3 Soil Contamination

2.3.4 Sediment Contamination

2.3.4.1 Woman Creek Drainage

2.3.4.2 South Walnut Creek Drainage

2.3.5 Surface Water Contamination

2.3.5.1 Surface Water Stations Southeast of 903 Pad Area

2.3.5.2 Upper South Walnut Creek

2.3.5.3 Seeps at the East Trenches Areas

2.3.6 Air Contamination

2.3.7 Summary of Contamination

2.4 Analytical Data

2.5 Site Conditions That Justify an IRA

3. IDENTIFICATION OF INTERIM REMEDIAL ACTION OBJECTIVES

3.1 Goals of Interim Measure/Interim Remedial Action

This section will state the objectives of the OU2 IM/IRA. The two primary objectives include the following:

- Provide an investigative tool to collect information that will aid in selection and design of final OU2 remedial actions.
- Remove VOC contamination from the subsurface.

3.2 Interim Remedial Action Schedule

3.3 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and Protection of Human Health and the Environment

3.3.1 Ambient or Chemical-Specific Requirements

3.3.1.1 Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and MCL Goals

3.3.1.2 Ambient Water Quality Criteria

3.3.1.3 Colorado Surface and Ground-Water Quality Standards

3.3.1.4 RCRA Ground-Water Protection Standards

3.3.1.5 Protection of Human Health and the Environment

3.3.2 Location-Specific Requirements

3.3.3 Performance, Design, or Other Action-Specific Requirements

4. PROPOSED ACTIONS

4.1 903 Pad and Lip Area (Site 1)

4.1.1 Site Description

A site description of the proposed test area will be provided. The discussion will focus primarily on site-specific contamination and hydrogeology.

4.1.1.1 Expected Conditions

A conceptual model describing test area contamination and subsurface hydrogeology will be developed and presented. Rationale for concept model assumptions will be provided based on existing site characterization data.

4.1.1.2 Uncertainties and Deviations

Per EPA Observational/Streamlined Approach guidance reasonably conceivable uncertainties in the expected conditions will be identified. The impacts to implementation of the remedial action and mechanisms to identify the deviations will be presented. (See attached table for example.)

4.1.2 Data Quality Objectives

4.1.3 Remedial Approach

4.1.3.1 Proposed Action Based on Expected Conditions

The specific activities necessary to implement the proposed remedial approach will be identified and described in detail. The discussion will include estimations of primary activity durations. The parameters and criteria necessary to monitor and ensure project success will be defined.

4.1.3.2 Contingency Plan

Per EPA Observational/Streamlined Approach guidance, contingency plans based on the potential deviations identified above will be presented.

4.1.4 Evaluation of Remedial Approach

The proposed remedial approach will be critically evaluated with respect to effectiveness, implementability, and environmental impact criteria.

4.1.4.1 Effectiveness

Effectiveness evaluation criteria include alternatives to land disposal; reduction of toxicity, mobility, and volume; reliability; protection of the community; and length of time until protection is achieved.

4.1.4.2 Implementability

Implementability evaluation criteria include availability, technical feasibility/constructability, and administrative feasibility (including public acceptance).

4.1.4.3 Environmental Impacts

Air Quality Impacts

Air quality impacts will be addressed by determining changes in ambient air quality due to the proposed remedial action. Changes in air quality may potentially result from emissions of VOCs and the generation of fugitive dust released during construction and operational activities of the proposed action. Potential VOC emissions from the proposed action will be evaluated relative to VOC emissions resulting from normal operational activities at the RFP currently regulated by the Colorado Department of Health. Radiological exposures will be evaluated based on regulatory compliance for the protection of human health and welfare. Discussions of air quality impacts will also include on-site compliance monitoring, and control methods that meet the regulatory requirements.

Inhalation and inadvertent ingestion of airborne radioactivity and VOCs on fugitive dusts will be analyzed in "Personnel Exposures." Pollution from engine emissions, fugitive dust generation by vehicles and particulates from tire wear will be analyzed separately in "Transportation Impacts."

Water Quality Impacts

Impacts to water quality regarding effluent discharges from the proposed action will be evaluated by comparison to background concentrations and chemical-specific ARARs. Discussions will include control methods involved with spills of liquids in accident conditions, and erosion control methods that would prevent dispersion of contaminated surface soils or water associated with construction, operation, and maintenance of ground-water treatment facilities.

Terrestrial and Aquatic Impacts

Regulations which require federal agencies to assess project impacts on terrestrial and aquatic biota will be discussed. Terrestrial and aquatic biota that may be negatively impacted from excavation, and construction of ground-water treatment facilities will be evaluated.

Wetlands and Floodplains

The relevant laws and acts that protect wetlands and floodplains will be discussed. Negative impacts from the proposed action that will effect wetlands habitats which are sustained by colluvial ground-water flow will be addressed. Discussion will also include any thermal impacts from the treated water, and expected return volumes of treated water that would more likely enhance wetlands rather than negatively impact them.

Any adverse impacts to floodplains will be included in the assessment.

Threatened and Endangered Species

Representative laws and regulations which protect threatened and endangered species will be discussed. This discussion will also include the three endangered species of interest at the RFP, critical habitat and potential food sources for these species. As excavation, construction, and operations of ground-water treatment facilities in OU2 will not impact threatened and endangered species, further discussion will not be included in subsequent sections.

Archeological and Historic Sites

Representative laws and regulations which protect archeological and historic sites will be discussed. As preliminary results from the historic and archeological survey of the RFP show no sites that have potential eligibility for the National Register of Historic Places, further discussion is not warranted and will not be included in subsequent sections.

Short-Term Used and Long-Term Productivity

Any minor short-term negative impacts from construction of operation of the ground-water treatment facility that would effect on-site personnel will be discussed.

Construction and operations of a ground-water treatment facility will have no effect on long-term productivity.

Personnel Exposures

The proposed action will involve processes which present potential exposure risks to workers, and the general public. Potential exposure pathways will be assessed including external radiation and potential uptake of radioactive and non-radioactive material by inhalation of respirable particulates or vapors. Personnel exposures

resulting from potential accidents involved with the proposed action will also be assessed.

Transportation Impacts

Potential transportation impacts during construction and operational phases of the ground-water treatment facility will be analyzed for both on-site and off-site impacts. Potential impacts include latent effects expected with vehicle pollution, traumatic injuries from accidents, fugitive dust and particulates generated by vehicles, and environmental impacts created by transportation accidents.

4.2 Mound (Site 2)

Same format as Section 4.1.

4.3 East Trenches (Site 3)

Same format as Section 4.1.

4.4 Existing RFP Treatment Systems (for collected ground water)

Descriptions of the following existing RFP treatment facilities that may be utilized for treatment of ground water collected from dewatering and/or interception during remedial approach implementation.

4.4.1 881 Hillside Ground-Water Treatment System

4.4.2 South Walnut Creek Basin Surface Water Treatment System

4.4.3 Building 910 Solar Pond Evaporators

4.4.4 Building 374 Evaporation System

4.5 Environmental Evaluation of No Action

4.5.1 Air Quality Impacts

The No Action Alternative will not further impact the existing air quality as discussed in the RFP Final Environmental Impact Statement, 1980.

4.5.2 Water Quality Impacts

Impacts to ground-water quality resulting from the No Action Alternative will be assessed based on contaminant concentrations in ground water at OU2 relative to the Colorado water quality control commission's ground-water protection standards for human health and agricultural uses. Discussion will include contaminant concentrations and distribution of VOCs and radionuclides in ground water at OU2 that most likely contribute towards increased environmental risk and degradation. Further discussion will include evidence of DNAPLs identified in OU2 that may exacerbate environmental degradation that may contribute towards a public health threat.

4.5.3 Terrestrial and Aquatic Impacts

The No Action Alternative will not further impact terrestrial and aquatic biota as data indicates contaminants in ground water do not result in demonstrable ecological changes.

4.5.4 Wetlands and Floodplains

The No Action Alternative will not further impact wetlands and floodplains.

4.5.5 Threatened and Endangered Species

The No Action Alternative will have no impact on threatened and endangered species.

4.5.6 Archeological and Historic Sites

The No Action Alternative will have no impact on archeological and historic sites.

4.5.7 Short-Term Uses and Long-Term Productivity

The No Action Alternative will not result in short-term uses and long-term productivity at OU2.

4.5.8 Personnel Exposures

The No Action Alternative will have minimal impact on current workers involved in OU2 or adjacent RFP sites. Workers will continue to monitor ground water which will not present any additional impact.

Potential public health risks resulting from the No Action Alternative are likely to occur from exposure to contaminants in ground water when contaminant plumes migrate off-site. Discussions will include a conservative assessment of potential public health risks based on potential exposure to VOCs and radionuclides in ground water at OU2.

4.5.9 Commitment of Resources

The No Action Alternative will not require any additional commitment of resources.

4.5.10 Transportation Impacts

The No Action Alternative will not require construction or transport of materials, which would eliminate the need for any additional on-site or off-site transportation activities.

4.5.11 Cumulative Impacts

The No Action Alternative will not result in any additional on-site exposure to workers, or increase risk due to transportation impacts. However, if left unaddressed, VOCs and radionuclides in ground water at OU2 will migrate off-site resulting in adverse environmental effects and severe threats to public health. Further discussions will include the cumulative impacts from the environmental and human health risks involved with this potential exposure to ground-water contaminated from OU2.

4.6 Comparison of Environmental Effects of Proposed Remedial Actions

This discussion will provide a summary of a comparison of impacts from the Proposed Actions and No Action Alternative. Comparisons will include the primary differences in impacts on the environment, occupational and human health exposures, and potential risks from transportation impacts. A summary of the cumulative impacts resulting from construction and operation of all ground-water treatment facilities in OU2 and nearby operational OUs will also be assessed.

5. IMPLEMENTATION PLAN

5.1 Technical Memorandums

A Technical Memorandum/Work Plan will be prepared for each remedial approach proposed in this IM/IRAP. The technical memorandums will present detailed conceptual designs, system performance specifications, and other pertinent technical information necessary to design, build, and implement.

5.2 Schedule

This section will present a milestone schedule for preparation of the technical memorandums, preparation of detailed IM/IRA system designs, and IM/IRA construction and startups.

6. REFERENCES

A list of literature sources referenced in the IM/IRAP will be provided.